OBESITY AND METABOLIC SYNDROME: RISK FACTORS FOR AIR POLLUTION RELATED ASTHMA HOSPITAL ADMISSIONS

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Background and Aims: Obesity has been shown to be associated with the presence of asthma in children and, to a lesser extent, adults. Additionally, acute exposure to elevated ambient air pollution has been demonstrated to increase the risk of respiratory hospital admission. However, the effect modification of obesity and metabolic syndrome on the association between air pollution and asthma hospital admissions has yet to be determined.
Methods: Data for unscheduled hospital admissions in New York City with a primary diagnosis of asthma was obtained for the years 2003-2006. A poisson generalized linear model was used to determine the association of a distributed lag model of ambient air pollution exposure with asthma hospital admissions for children (under 18), adults (18-64) and older adults (over 65). Additional analyses were conducted for children with a secondary diagnosis of obesity and adults with multiple secondary diagnoses corresponding with metabolic syndrome (i.e. hypertension, diabetes, hyperlipidemia, and obesity).
Results: After controlling for meteorological variables, temporal trends, and other possible confounders, short-term changes in ambient fine particle, nitrogen dioxide, and ozone concentrations were significantly associated with an increased risk of asthma hospital admissions in all age groups. A significant increase in risk of asthma hospitalization due to elevated pollutant concentrations was also observed in children with a secondary diagnosis of obesity, as compared to non-obese children. Also, a significant increase in risk of hospitalization was observed in adults and older adults with at least three of the secondary diagnoses that constitute metabolic syndrome as compared those individuals without metabolic syndrome.
Conclusions: Obesity in children and metabolic syndrome in adults are significant risk factors for air pollution related asthma hospital admissions. The identification of this susceptible subpopulation indicates an ongoing public health risk due to the increasing prevalence rates of both child obesity and metabolic syndrome in adults.